

Experiment 2

- Goggles!
- Safety!
- Quantitate vs Qualitative
- You should have turned in
 - Exercise A
 - Report for Experiment 1
- Review "Academic Honesty"
- MSDS
- Review Significant Digits for experiment
- Questions?

Qualitative vs Quantitative Data

Quantitate vs Qualitative

Categorical Data

Overview:

- Deals with descriptions.

- Data can be observed but not measured.

- Colors, textures, smells, tastes, appearance, beauty, etc.

- Qualitative → Quality

Numerical Data

Overview:

- Deals with numbers.

- Data which can be measured.

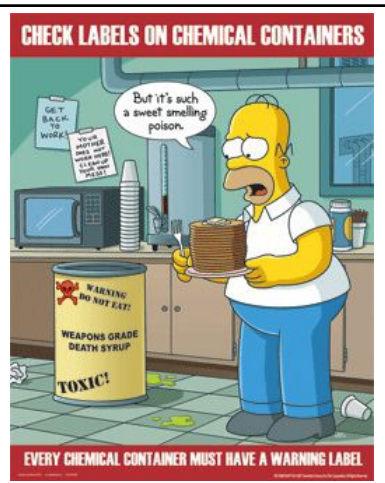
- Length, height, area, volume, weight, speed, time, temperature, humidity, sound levels, cost, members, ages, etc.

- Quantitative → Quantity

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MSDS



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MSDS

HEALTH HAZARD

4. DEADLY
3. EXTREME DANGER
2. HAZARDOUS
1. SLIGHTLY HAZARDOUS
0. NORMAL MATERIAL

FIRE HAZARD

4. FLASH POINTS
4. BELOW 73° F
3. BELOW 100° F
2. ABOVE 100° F NOT EXCEEDING 200° F
1. ABOVE 200° F
0. WILL NOT BURN

SPECIFIC HAZARD

- OXIDIZER OX
- USE NO WATER W
- SIMPLE ASPHYXIANT GAS SA
- CORROSIVE COR
- BIOLOGICAL HAZARD BIO
- POISONOUS POI
- RADIOACTIVE RA
- CRYOGENIC CYL

INSTABILITY

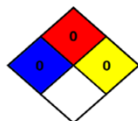
4. MAY DETONATE
3. SHOCK AND HEAT MAY DETONATE
2. VIOLENT CHEMICAL CHANGE
1. UNSTABLE IF HEATED
0. STABLE

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MSDS H₂O (AKA Water)

: 06/12/2018
: None.

0 - Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials.
0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.
0 - Material that in themselves are normally stable, even under fire conditions.



: 0 Minimal Hazard - No significant risk to health
: 0 Minimal Hazard - Materials that will not burn
: 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.
: A
A - Safety glasses

Additional Risks

- R1: Explosive when dry
- R2: Risk of explosion by shock, friction, fire or other sources of ignition
- R3: Extreme risk of explosion by shock, friction, fire or other sources of ignition
- R4: Forms very sensitive explosive metallic compounds
- R5: Heating may cause an explosion
- R6: Explosive with or without contact with air
- R7: May cause fire
- R8: Contact with combustible material may cause fire
- R9: Explosive when mixed with combustible material
- R10: Flammable
- R11: Highly flammable
- R12: Extremely flammable
- R14: Reacts violently with water
- R15: Contact with water liberates extremely flammable gases
- R20: Harmful by inhalation
- R21: Harmful in contact with skin
- R22: Harmful if swallowed
- R23: Toxic by inhalation
- R24: Toxic in contact with skin
- R25: Toxic if swallowed
- R26: Very toxic by inhalation
- R27: Very toxic in contact with skin
- R28: Very toxic if swallowed
- R29: Contact with water liberates toxic gas.
- R30: Can become highly flammable in use
- R31: Contact with acids liberates toxic gas
- R32: Contact with acids liberates very toxic gas
- Up to: -
- R66: Repeated exposure may cause skin dryness or cracking
- R67: Vapours may cause drowsiness and dizziness
- R68: Possible risk of irreversible effects

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MSDS NaCl

NFPA Hazard ID



Flammability
Health
Reactivity
Special hazard.

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

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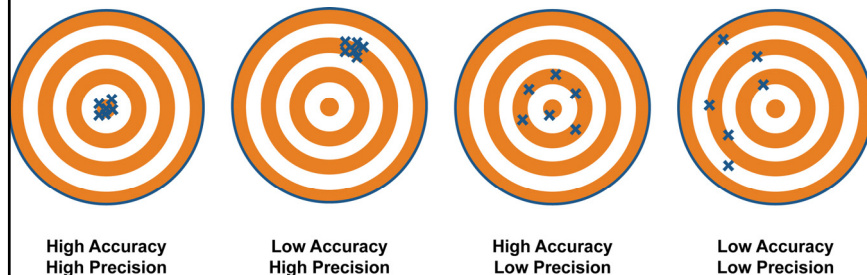
SO... Do we need Goggles????



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Precision vs Accuracy



Random – Values are all over the place but the average should be close to the theoretical value
 Systematic – Values are off in a certain direction
 (read the lab manual)

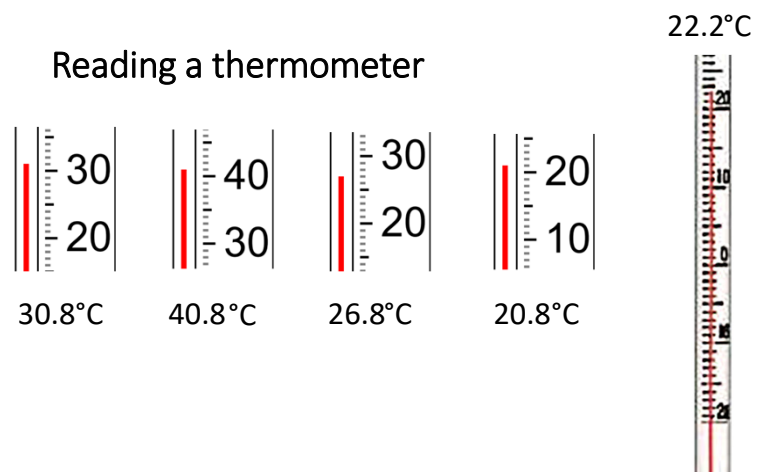
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Graduated Cylinder Meniscus



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Reading a thermometer



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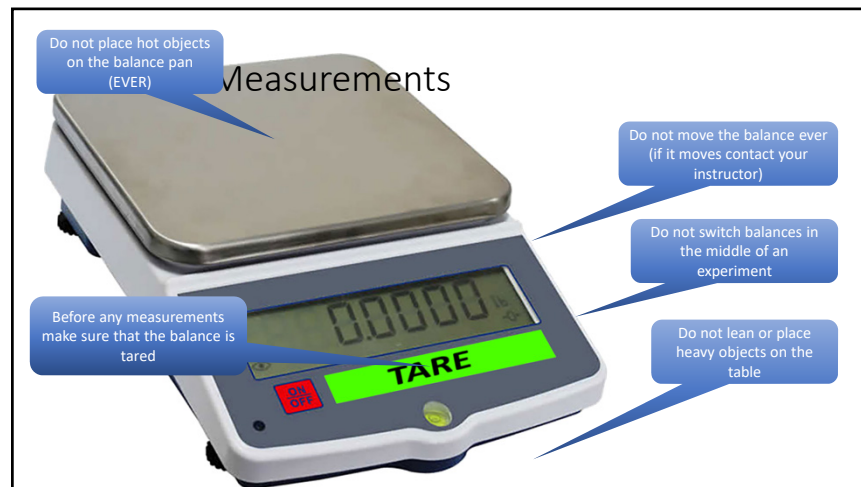


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Things to remember when determining the mass of objects

- Your hands contain oils and other contaminants. This can change measurements of approximately 0.01g. If you need higher precision, do not touch the objects with your hands.
- Liquids on the outside of containers are a "no no". Make sure that you are neat and tidy with performing measurements.
- Breathing, A/C and other turbulence on the balance pan can change measurements up to 0.1g. Make sure that there are no unnecessary turbulences on the balance pan.
- Center your sample on the balance pan. Some less costly balances will introduce errors if you place the sample near the edge.
- Always make sure that your measurements make sense.

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Balance tricks

- Using the tare button to do your subtractions
- Using the tare button to assist with getting approximate measurements
 - You all showed up so no more... ☺

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In grading exercise A...

- Most points were lost due to individuals **forgetting units**
- Next most points were lost due to individuals **forgetting significant digits**

- I want a hearing aid for christmas

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Some notes on your lab...

- A 1. there should be $XX.X^{\circ}\text{C}$
 there should be 3-SF for $^{\circ}\text{F}$
 2. there should be $XX.X^{\circ}\text{C}$
 there should be $XX.X^{\circ}\text{C}$

I should have at the end of the day...

Exercise A
 Experiment 1

Send email to students that next week we will have a quiz on the elements and polyatomics (only single charged polyatomics)

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